

REMARKS

Reconsideration of this application is respectfully requested.

The rejection of claims 1 to 3, 6, 10 to 12, 24 to 26, 28, 33, 34 and 37 as being anticipated by Muller (Patent Publication 2002/0070729) is traversed.

Claims 1, 10, 24 and 28 are independent. These claims have been amended to require a magnitude of a gap (or width of a medium) be determined by the claimed non-contact sensor. There is no anticipation because Muller does not measure the magnitude of a gap and does not apply a sensor signal to control the gain of an amplifier.

I. Independent Claims 1 and 28:

Claims 1 and 28 define a method for non-contact measurement in that measures a distance or dielectric property as a proportionality. Claims 1 and 28 have been amended to require “determining a **magnitude** of the displacement based on the difference between the output of the amplifier and the high frequency signal.” (emphasis indicating amendment). In the embodiment disclosed in the application, the non-contact measurement method produces an output voltage which is proportional to a gap between a sensor plate and the target material.

In contrast to the claimed invention, the Muller proximity sensor detects a trigger event which may be when the sensor is proximate to a surface. Muller, paras. 0025, 0028. In particular, the Muller proximity sensor produces an output that switches when the target is close to the sensor. Muller does not determine the magnitude of the

displacement between the sensor and the target. Accordingly, Muller does not anticipate because it does not determine a magnitude of a displacement.

There is no anticipation of claims 1 and 28 for the additional reason that Muller does not control the “gain” of an amplifier. Claim 1 requires: “applying the high frequency signal and a signal from a sensor plate of the conductive plates **to control a voltage gain of an amplifier** in the circuit.” (Emphasis added). Claim 28 has a similar limitation regarding controlling an amplifier gain. In the disclosed embodiment of the invention, the capacitance between the measurement plate and the target material is applied to change the AC gain of an op amp. Spec. para. 0019.

Muller does not control the gain of an amplifier. Muller senses the amount of signal which is capacitively coupled onto a measurement plate. Capacitance between the measurement plate and the target material reduces the coupled signal amplitude which is measured by an operational amplifier (op amp) Muller para. 0031. The measurement does not change the gain of an op amp.

The anticipation rejection of claims 1 and 28 (and their dependent claims) should be withdrawn because Muller does not anticipate those claims.

II. Independent Claims 10 and 24:

The anticipation rejection of claims 10 and 24 should be withdrawn for the same reasons that claims 1 and 28 are patentable. Claims 10 and 24 are limited to measuring a magnitude and changing an amplifier gain.

III. Patentability of Dependent Claims:

A. *Claims 2 and 33:*

The invention defined by claims 2 and 33 takes a difference between the output of an amplifier and a reference signal to strip off the reference signal from the measurement and reduce errors caused by changes in the reference signal. The output of the first amplifier is already indicative of the sensor gap. In particular, claims 2 and 33 require differentiating an output of an amplifier and a high frequency signal by “sensing a difference between a peak of the output of the amplifier and a peak of the high frequency signal.”

B. *Claims 3 and 34:*

Claims 3 and 34 require an amplifier that controls the signal on the sensor plate. The AC gain of the amplifier changes as a function of the capacitance between the measurement plate and the target providing an output voltage signal which is indicative of this capacitance. Claims 3 and 34 require: “controlling the gain further comprises applying the signal from the sensor plate and the high frequency signal as inputs to an operational amplifier.”

Muller applies the signal from the sensor plate and the high frequency signal to an op amp which is used to take the difference between the two signals and obtain a measurement. Muller does not teach controlling the gain on the op amp.

C. *Claims 6, 14 and 37:*

Claims 6, 14 and 37 require:

controlling the gain further comprises applying the signal from the sensor plate and the high frequency signal as inputs to an operational amplifier, and wherein differentiating further comprises **applying an output of the operational amplifier and the high frequency signal as inputs to a difference amplifier** which generates a cyclical difference signal indicative of the gap, and applying the cyclical difference signal to a peak detector which generates a signal indicative of a peak value of the cyclical signal, and wherein said peak value is indicative of the gap. (Emphasis added).

In the sensor embodiment disclosed in this application, an op amp controls the signal on the sensor plate so that there is minimal difference between the signal on the sensor plate and the oscillator driven plate. If there is no difference between these two signals, the sensor will not be sensitive to changes in the cable parameters due to temperature or other environmental conditions.

Muller applies a signal from the measurement plate and a reference signal to an op amp to generate a difference signal. This difference signal is the difference between the signal on the sensor plate and the oscillator driven reference plate. Muller does not teach applying the output of an op amp and the high frequency signal to a difference amplifier.

The rejection of dependent claims 4, 5, 7 to 9, 13, 15 to 17, 27, 29 to 32, 35, 36 and 38 to 40 as being obvious over Muller in view of Tardif et al (US Patent 6,307,385) is traversed.

These dependent claims should be allowed for the same reasons as stated above for their corresponding independent claims.

HOWARD et al.
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All claims are in good condition for allowance. If any small matter remains outstanding, the Examiner is requested to telephone applicants' attorney. Prompt reconsideration and allowance of this application is requested.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: /Jeff Nelson/

Jeffrey H. Nelson
Reg. No. 30,481

JHN:glf
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100